CASE STUDY: RECONSTRUCTION OF FELINE’S ‘MISSING’ UPPER EYELID

Author: Christine Heinrich

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Christine Heinrich reports on the Mustardé technique, which she used to achieve a functional palpebral fissure in a kitten suffering a painful eyelid coloboma

The Mustardé procedure, while technically challenging, proved valuable in constructing a functional eyelid in a case of an extensive eyelid coloboma in a kitten.

Rose, a four-month-old, female, entire Persian kitten, was presented to us by her breeder, who reported she had a history of “missing most of her right upper eyelid” since opening her eyes.

The referring surgeon had correctly diagnosed an extensive eyelid coloboma, which involved the majority of the right upper eyelid and the lateral canthus. Only a small part of the medial upper right eyelid was formed normally.

As a result of the chronic trichiasis, Rose had been suffering chronic corneal pain and had largely kept the affected eye closed (Figure 1a).

Slit lamp examination of the cornea was only possible following application of local anaesthetic and manual eversion of the lid. It revealed extensive corneal scarring and vascularisation (Figure 1b).

Management options

Surgical correction of trichiasis and lagophthalmia is the treatment of choice in all patients suffering
from eyelid colobomas. However, in large defects, it can be extremely difficult to construct a new lid margin.

Techniques using sliding (H-figure plasty) or rotational skin grafts (the Roberts-Bistner procedure for repair of eyelid agenesis in the cat), with their many modifications, are generally successful in correcting lagophthalmia associated with the eyelid defect (Gelatt, 1994).

However, the above techniques generally fail to replace the normal, hair-free mucocutaneous lid margin. Trichiasis is, therefore, likely to persist and require additional surgical management.

The Mustardé-rotational skin graft (Figure 2) is successful in restoring a normal upper eyelid margin, (Mustardé, 1981). Transposition of the oral commissure via a skin graft has also been reported to manage feline colobomas that involve both the upper and the lower eyelid (Whittaker, 2010).

Conservative management of trichiasis in cases of upper lid colobomas with frequent lubricant application could be considered, but is rarely adequate in managing patient discomfort and preventing progressive corneal scarring.

In cases of unilateral colobomas, where reconstructive surgery is not an option, enucleation of the affected eye should, therefore, be considered to prevent the patient having to live with chronic and debilitating ocular pain.

**Surgical management in our patient**

For Rose, a modified Mustardé procedure was recommended as the treatment of choice. The option of transposing the oral commissure was not chosen, as it was believed preferable to replace the upper lid with “true lid margin”, rather than with the mucocutaneous junction of the oral conjunctiva and skin.

The kitten’s owner was counselled that the Mustardé procedure is a two-stage procedure, in which a pedicle flap from the lower eyelid is transferred into the upper eyelid coloboma (Figure 2). The second part of the procedure, in which the pedicle is separated, is performed four to six weeks after the initial operation. This way, the original upper lid defect is “shared” between the upper and lower lids.

Rose’s owner was advised that while we hoped to be able to restore a functional palpebral fissure with surgery, it was likely that –keeping in mind the extent of the eyelid defect – the affected palpebral fissure would always remain slightly smaller than that of the normal eye. In addition, the owner was made aware that the abnormally formed lateral canthus, which also showed trichiasis, might require an additional surgical procedure.

Surgical intervention was carried out under routine general anaesthesia with the help of the
operating microscope. Perioperative analgesia was provided with buprenorphine and meloxicam, and systemic antibiosis with potentiated clavulanic acid was also given.

To begin, the recipient site (area of colobomatous lid defect) was prepared to receive the lower lid graft. The lower lid pedicle, which was the size necessary to replace the upper lid defect, was marked. Basic rules in harvesting the graft were observed: approximately 50 per cent of the lower eyelid was taken to reconstruct the upper eyelid, and the base of the pedicle was wide enough to ensure a good vascular supply to the graft. The proposed graft was created with full-thickness incisions, elevated and rotated into the upper lid defect (Figure 3a).

Initially, cardinal sutures were placed at the edges of the eyelid margin to secure the graft and, as far as possible, partial thickness subconjunctival sutures were placed before skin closure was carried out (Figure 3b).

For all skin sutures, 6/0 vicryl was used; 8/0 vicryl was chosen where subcuticular sutures were placed. On completing the surgery, the surgical wound margins were infiltrated with local anaesthetic to maximise perioperative analgesia.

Rose recovered well from her original operation and appeared comfortable (Figure 3c). Postoperative medication consisted of a two-week course of chloramphenicol eye drops, meloxicam and potentiated amoxicillin with clavulanic acid.

An episode of bilateral conjunctivitis in connection with an upper respiratory tract infection, which Rose developed four weeks after the initial surgery, was managed medically.

As a result, Rose returned for the second part of the procedure (slightly later than ideal) six weeks later, at which point the graft was found to have healed well into the recipient site (Figure 3d).

Under general anaesthesia, the base of the pedicle was separated from the lower eyelid and both upper and lower eyelid margins were reconstructed with wedge excisions (Figure 3e).

In addition, the lateral canthus was reconstructed to address the congenital malformation at this site, which had not been corrected by the routine Mustardé procedure (Figure 3f). Again, postoperative medical treatment was provided as after the first procedure.

**Outcome**

A final check-up four weeks following the second procedure revealed that the surgery had led to a satisfactory result (Figure 4).

The palpebral fissure conformation in the operated eye was functionally and cosmetically acceptable, although a small “notch” remained present on the upper lid – correspondent with the
original medial aspect of the coloboma. The defect, however, did not have any clinical significance – as evidenced by the ocular comfort and the marked improvement in corneal health and further surgical intervention was, therefore, not recommended at this point.

**Discussion**

The Mustardé procedure has proven to be valuable in constructing a functional eyelid margin in this case of a kitten with a large eyelid coloboma.

The technique should also be considered for reconstructing the upper eyelid after major trauma or resection of large eyelid masses.

Technically challenging, the procedure should be carried out by surgeons experienced in adnexal surgery.

The availability of appropriate equipment for magnification (operating microscope or at least ×4 loupes), illumination, surgical instruments and suture materials is a prerequisite to achieve a successful outcome of any eyelid surgery, but specifically so for a technique as complex as the Mustardé procedure.

**References**